



A NEW SPECIES OF GALL MIDGE (DIPTERA: CECIDOMYIIDAE)
ASSOCIATED WITH *THEOBROMA BICOLOR* (STERCULIACEAE) FROM PERU¹
(With 13 figures)

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ABSTRACT: *Dasineura theobromae*, a new species of gall midge (Diptera: Cecidomyiidae) that attacks leaves of *Theobroma bicolor* (Sterculiaceae) is described (larva, pupa, male, female, and gall) based on material from Peru.

Key words: Cecidomyiidae. Diptera. Sterculiaceae. taxonomy. *Theobroma*.

RESUMO: Uma nova espécie de mosquito galhador (Diptera: Cecidomyiidae) associada com *Theobroma bicolor* (Sterculiaceae) do Peru.

Dasineura theobromae, uma nova espécie de mosquito galhador (Diptera: Cecidomyiidae) que ataca folhas de *Theobroma bicolor* (Sterculiaceae) é descrita (larva, pupa, macho, fêmea e galha) com base em material do Peru.

Palavras-chave: Cecidomyiidae. Diptera. Sterculiaceae. taxonomia. *Theobroma*.

INTRODUCTION

Theobroma bicolor Humb & Bonpl. (Sterculiaceae) is commonly known as “macambo” (Peru), “cacau do Peru” (Brazil), “bacau” (Colombia) or “patashte” (England). This plant is native to tropical America, and has probably an Amazonian origin. It has been recorded from Central and South America, from Mexico to Brazil (CALZADA, 1980; LEÓN, 1987; FLORES, 1997, LEAL *et al.*, 2000). *Theobroma bicolor* is cultivated in Peruvian farms and orchards in Loreto, Ucayali and Junín (VÁSQUEZ, 1989; FLORES, 1997). It reaches 25-30m in height in nature, but does not grow so tall in cultivation. The plant has a straight stem, a relatively small crown, large ovoid-oblong leaves (30-35cm of length and 15-18cm of width), that are dark green beneath and whitish-green on top. The fruit is a non-dehiscent, voluminous, ellipsoidal, reticulate-striated capsule about 30cm long and 12cm in diameter. It is important economically for the mucilage of the mature fruit that is used in the manufacturing of ice cream and juice. Seeds contain fats of good quality and are roasted or boiled for consumption. Seeds are also used in the manufacture of chocolates and other confectioneries (CAVALCANTE, 1979; CALZADA, 1980; LEÓN, 1987; FLORES, 1997).

Cecidomyiidae galls were found on leaves of *Theobroma bicolor*. Morphological studies indicate that the galler is a new species of *Dasineura* Rondani 1840, which is herein described. *Dasineura* is a catch-all genus with more than 400 described species in the world, 10 of them are known in the Neotropics (GAGNÉ, 2004).

MATERIAL AND METHODS

The field work was carried out from November, 2004 to May, 2005 by J.Vásquez. The material was collected in a bank of “macambo” germplasm, belonging to the Centro de Investigaciones Allpahuayo (Instituto de Investigaciones de la Amazonia Peruana (CIA-IIAP), km 26.5 of the Iquitos – Nauta highway, Iquitos-Peru (0675817-9561780 UTM) (Proyecto Desarrollo Tecnológico de Frutales Nativos). Attacked leaves were collected and transported to the laboratory, where part of the sample was dissected under a stereoscopic microscope to obtain larvae and pupae. The remainder was kept in plastic bags containing wet tissue paper to obtain adults. Specimens were first preserved in 96% alcohol and later mounted on slides following the methodology of GAGNÉ (1994). The genus

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was identified based on the key of GAGNÉ (1994). All specimens (including types) were incorporated in the collection of Museu Nacional, Rio de Janeiro.

The description of the new species was done by V.C.Maia.

RESULTS

The gall midge that attacks the leaves of *Theobroma bicolor* belongs to the genus *Dasineura*. Its placement here is based mainly on characters of the male terminalia, wing venation, shape of circumfila, flagellomeres, and ovipositor. The new species differs from most *Dasineura* spp. in its two-segmented palpus, undivided female tergite 8, and reduced number of larval lateral papillae. Most *Dasineura* spp. have four-segmented palpus, a divided female tergite 8, and the full complement of larval lateral papillae (2 groups of three lateral papillae per side). In fact, differences between the new species and other *Dasineura* are considered minor inasmuch as the genus is at present broadly defined, its diagnostic limits are unclear, and the sample of its type species is probably lost. So, while an extensive revision is not done, this genus-group should be considered as *Dasineura latu sensu*.

Dasineura theobromae Maia, sp.nov. (Figs.1-13)

Diagnosis – Two larval lateral papillae on each side of the spatula; pupal antennal horn well developed, 4 or 5-toothed; pupal facial papillae absent; adult with palpus two-segmented and setose; male tergites 7 and 8 fusiform with only a pair of trichoid sensilla; male sternites 2-8 quadrate with caudal and midlength rows of setae, no lateral setae, two basal trichoid sensilla and elsewhere with scattered scales; male hypoproct deeply bilobed, about as long as cercus; female cerci fused, rounded at apex.

Larva – Body length: 1.9-2.1mm (n=2). Colour: yellow. Spatula two-toothed, length: 0.15-0.17mm (n=2); teeth pointed at apex, stalk well developed (Fig.1). Sternal papillae asetose. Two setose lateral papillae on each side of the spatula. Terminal segment with spiny tegument.

Pupa – Body length: 1.6-2.4mm (n=3). Cephalic region (Fig.2): cephalic setae with 0.05-0.06mm of length (n=3); antennal horn well developed, 4 or 5-toothed (length: 0.23-0.25mm, n=3); facial papillae absent. Thorax: prothoracic spiracle digitiform with 0.09-0.11mm of length (n=3) (Fig.3). Wing sheath reaching

basal third or half of abdominal segment 4. Foreleg sheath reaching $\frac{1}{2}$ of abdominal segment 5 or $\frac{1}{2}$ of abdominal segment 6 or ending near distal margin of abdominal segment 6. Midleg sheath reaching the distal margin of abdominal segment 5 or basal $\frac{1}{3}$ of abdominal segment 6 or ending near distal margin of abdominal segment 6. Hind leg sheath reaching basal $\frac{1}{3}$ or $\frac{1}{2}$ of abdominal segment 6. Abdominal tergites II-VIII with numerous spinules and no spines.

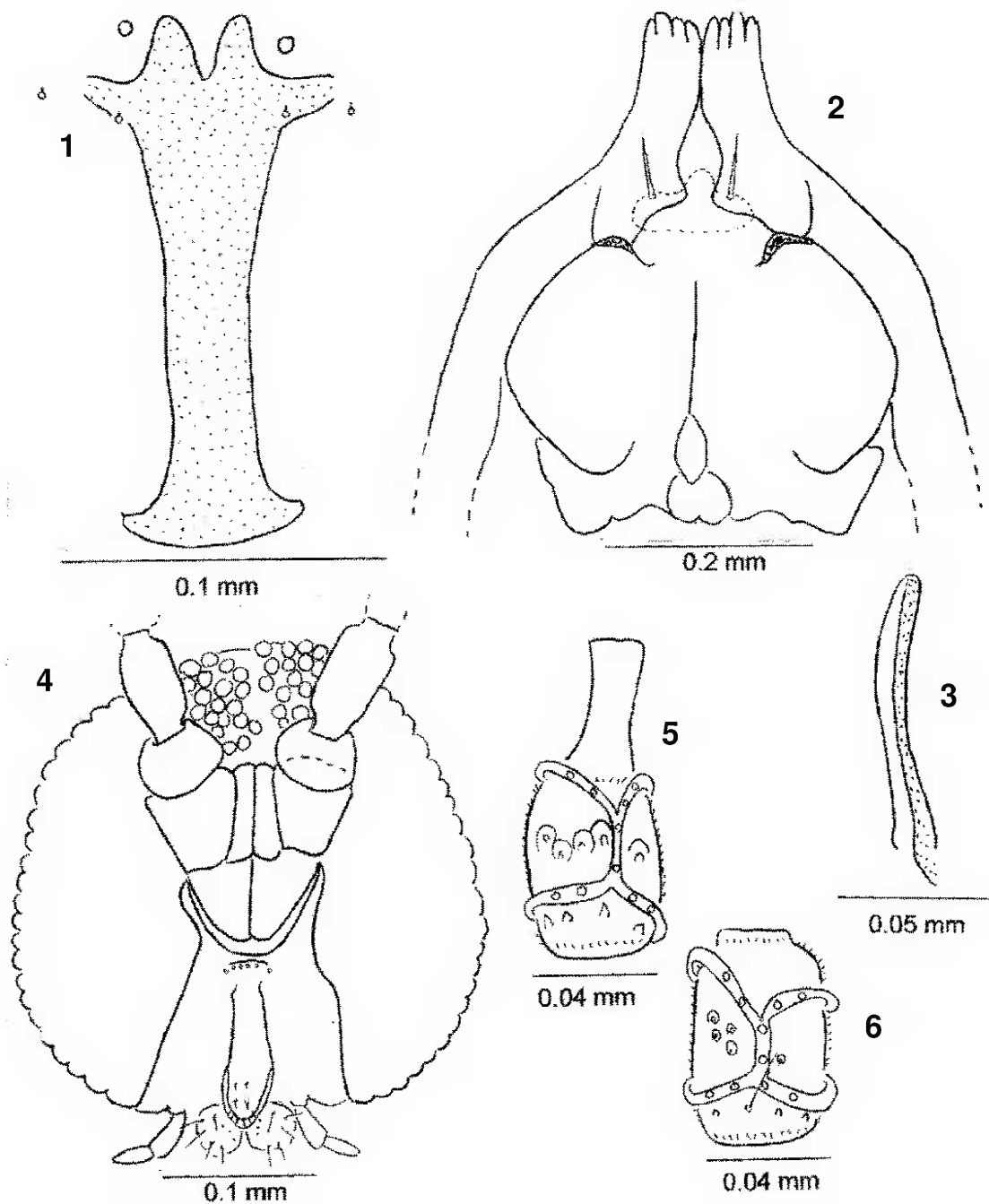
Adult – Length: 1.75-2.3mm in male (n=3); 2.2-2.5mm in female (from head to abdominal segment 8, n=3). Head (Fig.4): eye facets circular; antenna with 14 flagellomeres in female (broken in male); flagellomeres 1 and 2 connate; flagellomeres 1-13 cylindrical; flagellomere 14 ovoid; flagellomere necks bare and appreciably longer in male; circumfila similar in both sexes, forming two interconnected horizontal rings (Figs.5-6); flagellomere 12 without apical process; frontoclypeus with few long setae; labrum triangular, long-attenuate, with 2 pairs of ventral sensory setae and long, anteriorly directed lateral setulae; hypopharynx of the same shape as labrum with long, anteriorly directed lateral setulae; labellae convex, each with some lateral setae and three short mesal sensory setae; palpus with two setose segments. Thorax. Wings (Fig.7): length (from arculus to apex): 1.4-1.5mm in male (n=3); 1.7-1.75mm in female (n=3); anepisternum bare; anepimeron with few discal setae; tarsal claws thin, bent beyond midlength and toothed on all legs; empodia well developed, reaching to bend in claws (Fig.8).

Abdomen – ♂ (Fig.9): tergites 1-6 rectangular with single, complete row of caudal setae, no lateral setae, two basal trichoid sensilla and elsewhere with scattered scales; tergites 7 and 8 fusiform with only a pair of trichoid sensilla; sternites 2-8 quadrate with caudal and midlength rows of setae, no lateral setae, two basal trichoid sensilla and elsewhere with scattered scales. ♀ (Fig.10): tergites 1-8 as 1-6 in male; sternites 2-7 as 2-8 in male; sternite 8 not sclerotized; sternite 9 with scattered setae. Male terminalia (Fig.11): gonocoxite cylindrical, robust; gonostylus tapering from base to apex; cerci convex apically; hypoproct deeply bilobed, about as long as cercus, the lobes conspicuously thinner; parameres robust, clasping aedeagus and emarginate apically; aedeagus elongate and attenuate to apex. Ovipositor elongate-protrusible; length from basal margin of abdominal segment 9 to ovipositor apex: 0.55mm (n=4); female cerci fused, rounded at apex (Fig.12).

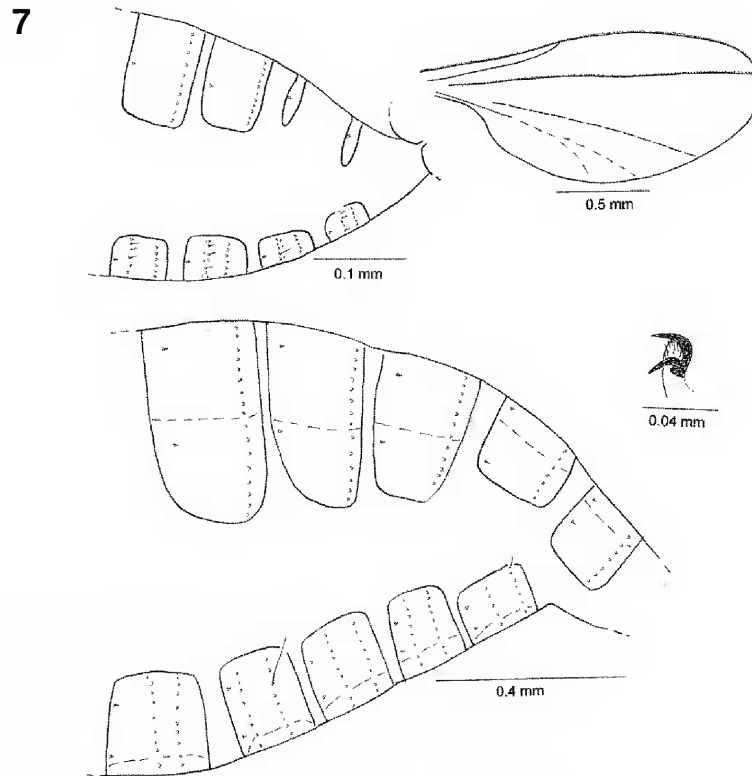
Gall (Fig.13) – Completely glabrous; conical, larger and yellowish on the upper surface of leaf, median part annulate and olive green, and shorter and whitish on the under surface; length: 0.65 ± 0.44 cm; medial width: 0.48 ± 0.43 cm (n=15). Number of galls/leaf 2-472. Pupation in the gall. Number of gall midge larvae/gall:1.

Material examined – Holotype ♂ : Peru: Loreto, Iquitos, 20/IX/2004, J.Vásquez col., MNRJ. Paratypes: same data as holotype, 3♂ and 13♀ ; same locality, 21/II/2005, J.Vásquez col., 1 pupa and 6 larvae; same locality, VI.2005, J.Vásquez col., 12 pupae and 6 larvae, MNRJ.

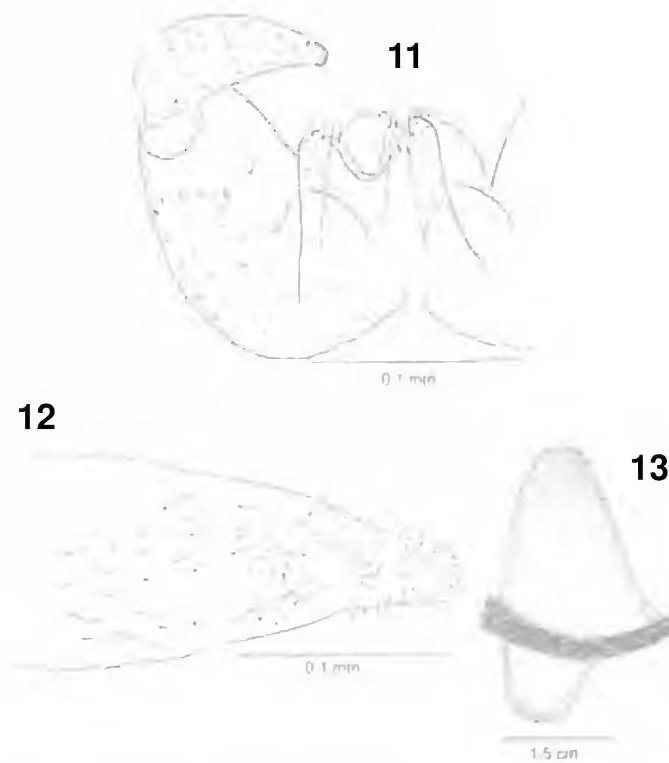
Etymology – The name *theobromae* is the genitive of the host plant name.



Dasineura theobromae sp.nov.: fig.1- larva, spatula and associated papillae, ventral view; fig.2- pupa, cephalic region, frontal view; fig.3- pupa, protoracic spiracle, dorsal view; fig.4- ♀ , head, frontal view; fig.5- Male flagellomere 5; fig.6- ♀ , flagellomere 5.



Dasineura theobromae sp.nov.: fig.7- female wing; fig.8- female foretarsal claw and empodium, lateral view; fig.9- ♂, abdominal segment 5 to end, lateral view; fig.10- ♀, abdominal segment 4 to end, lateral view.



Dasineura theobromae sp.nov.: fig.11- Male terminalia, dorsal view (one gonopod removed); fig.12- apex of ovipositor, dorsal view; fig.13- gall, general aspect.

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